

CLAIMS

1. A method of installing a molecular sieve bed gas enriching system in a vehicle, the system including a plurality of molecular sieve beds each of which is operable in a charging phase to adsorb non-product gas from a high pressure gas supply, and in a venting phase when the sieve bed is connected to a low pressure, to release adsorbed non-product gas from the molecular sieve bed, the method including installing in the vehicle a system controller, a product gas distribution conduit which extends to at least one product gas distribution position, and a high pressure gas supply conduit which extends from a high pressure gas source, providing a plurality of molecular sieve bed modules, each module including a container containing molecular sieve bed material, a first gas communication port from the container with an outlet duct for product gas produced in use during the charging phase of the molecular sieve bed, the outlet duct including an outlet valve to prevent ingress of gas into the container through the first gas communication port, and the container including a second gas communication port which is connected to a valve assembly which, depending upon the controlled state of the valve assembly, in use permits of communication between the interior of the container and one of a gas supply duct during the charging phase of the molecular sieve bed and a venting duct during the venting phase of the molecular sieve bed, introducing each of the modules independently into the vehicle, connecting each of the outlet ducts to the product gas distribution conduit, connecting each of the gas supply ducts to the high pressure gas supply conduit, and connecting the controller to each of the valve assemblies of the modules so that the controller is operable in use to change the controlled state of each of the valve assemblies.

2. A method according to claim 1 wherein each of the venting ducts is connected at least in use of the system, to a low pressure.

3. A method according to claim 1 which includes connecting each venting duct to a gas venting conduit which extends to a vent outlet from the vehicle.

4. A method according to claim 1 wherein each of the valve assemblies includes an electrically operated valve which in use responds to a control signal from the controller to assume a controlled state, and the method includes electrically connecting the electrically operated valve to the controller during installation.

5. A method according to claim 4 wherein the method includes installing control cables in the vehicle prior to introducing the modules into the vehicle.

6. A method according to claim 1 wherein the vehicle includes a gas turbine engine, and the high pressure gas is bled from the engine.

7. A method according to claim 6 wherein the vehicle is an aircraft and the product gas is oxygen enriched gas.

8. A method according to claim 1 wherein the method includes programming the controller to operate the valve assemblies of the molecular sieve bed modules according to a control algorithm .

9. A method according to claim 8 wherein the method includes programming the controller to select a control regime from a plurality of control regimes automatically depending upon the number of molecular sieve bed modules which are operable in the system.

10. A molecular sieve bed gas enriching system for a vehicle, the system including a plurality of molecular sieve beds each of which is operable in a charging phase to adsorb non-product gas from a high pressure gas supply, and in a venting phase when the sieve bed is connected to a low pressure, to release adsorbed non-product gas from the molecular sieve bed, the system further including a system controller, a product gas distribution conduit which extends to at least one product gas distribution position in the vehicle, and a high pressure gas supply conduit which extends from the high pressure gas supply of the vehicle, the molecular sieve beds each being provided as a component of a molecular sieve bed module, each module including a container containing molecular sieve bed material, a first gas communication port from the container with an outlet duct for product gas produced in use during the charging phase of the molecular sieve bed, the outlet duct including a valve to prevent ingress of gas into the container through the first gas communication port, and the container including a second gas communication port which is connected to a valve assembly which, depending upon the controlled state of the valve assembly, in use permits of communication between the interior of the container and one of a gas supply duct during the charging phase of the molecular sieve bed and a venting duct during the venting phase of the molecular sieve bed, each of the outlet ducts of the modules being connected to the product gas distribution conduit, and each of the gas supply ducts being connected to the high pressure gas supply, and the controller being connected to each of the valve assemblies of the modules so that the controller is operable in use to change the controlled state of each of the valve assemblies.

11. A vehicle including a molecular sieve bed gas enriching system, the system including a plurality of molecular sieve beds each of which is operable in a charging phase to adsorb non-product gas from a high pressure gas supply, and in a venting phase when the sieve bed is connected to a low pressure, to release adsorbed non-product gas from the molecular sieve bed, the method including installing in the vehicle a system controller, a product gas distribution conduit which extends to at least one product gas distribution position, and a high pressure gas supply conduit which extends from a high pressure gas source, providing a plurality of molecular sieve bed modules, each module including a container containing molecular sieve bed material, a first gas communication port from the container with an outlet duct for product gas produced in use during the charging phase of the molecular sieve bed, the outlet duct including an outlet valve to prevent ingress of gas into the container through the first gas communication port, and the container including a second gas communication port which is connected to a valve assembly which, depending upon the controlled state of the valve assembly, in use permits of communication between the interior of the container and one of a gas supply duct during the charging phase of the molecular sieve bed and a venting duct during the venting phase of the molecular sieve bed, introducing each of the modules independently into the vehicle, connecting each of the outlet ducts to the product gas distribution conduit, connecting each of the gas supply ducts to the high pressure gas supply conduit, and connecting the controller to each of the valve assemblies of the modules so that the controller is operable in use to change the controlled state of each of the valve assemblies.

12. A vehicle according to claim 11 which is an aircraft.